

UNIVERSITY OF MADRAS
B.Sc. DEGREE PROGRAMME IN ADVANCED ZOOLOGY
AND BIOTECHNOLOGY
SYLLABUS WITH EFFECT FROM 2023-2024

Course Code	Course Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
21DSEA	ANIMAL BEHAVIOUR	DSE	Y	-	-	-	3	4	25	75	100

Learning Objectives

1. To learn the origin and development of animal behaviour and to understand the influence of genetics, environment on animal behaviours.
2. To understand the biological properties of animal behavior, with an evolutionary and ecological emphasis.
3. To Compare innate and learned behavior and differentiate between various mating system.
4. To impart the knowledge about visual and auditory communication; courtship, mate choice, and mating systems; social behavior and social systems; and animal personality.
5. To discuss how movement and migration behaviors are a result of natural selection.

Unit I: Genetics and Behaviour : Genetic material, Genes and chromosomes, Genetic variation, Single and Polygenic inheritance of behaviour, Heritability of behaviour, Natural selection and behaviour, Frequency distribution of phenotypes, Darwinian fitness, Evolution of adaptive strategies.

Unit II: Evolution and Social Behaviour : Sexual selection, Altruism, Sexual strategy and social organisation, Animal perception, Neural control of behaviour, Sensory processes and perception, Visual adaptations to unfavourable environments.

Unit III: Animal and the Environment: Coordination and Orientation, Homeostasis and Behaviour, Physiology and Behaviour in changing environments, Animal Learning, Conditioning and Learning, Biological aspects of learning, Cognitive aspects of learning.

Unit IV: Understanding Complex Behaviour :Instinct and learning, Displacement activities, Ritualization and Communication, Decision making behaviour in Animals, Complex behaviour of honey bees, Evolutionary optimality, Mechanism of Decision making. The mentality of Animals : Languages and mental representation, non-verbal communication in human, mental images,Intelligence, tool use and culture, Animal awareness and Emotion.

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Unit V: Chronobiology : Organization of circadian system in multicellular animals; Concept of central and peripheral clock system; Circadian pacemaker system in invertebrates with particular reference to *Drosophila*; Photoreception and photo-transduction; The physiological clock and measurement of day length; Molecular bases of seasonality; The relevance of biological clocks for human welfare - Clock function (dysfunction); Human health and diseases - Chronopharmacology, chronomedicine, chronotherapy.

Text Books

1. David McFarland, 1985. *Animal Behaviour*, Longman Scientific & Technical, UK. 576pp.
2. Harjindra Singh, 1990. *A Text Book of Animal Behaviour*, Anomol Publication, 293pp.
3. Hoshang S. Gundevia and Hare Govind Singh, 1996. *Animal Behaviour*, S. Chand & Co, 280pp.
4. Shukla, J. P 2010, *Fundamentals of Animal Behaviour*, Atlantic, 587pp.
5. Vinod Kumar, 2002. *Biological Rhythms*. Narosa Publishing House, Delhi.

Suggested Readings

1. Michael D. Breed and Janice Moore, 2012. *Animal Behaviour*, Academic Press, USA, 359pp.
2. Aubrey Manning and Martin Stamp Dawkins, 2012. *An Introduction to Animal Behaviour*, 6th Edition, Cambridge University Press, UK. 458pp.
3. Davis E. Davis, 1970. *Integral Animal Behaviour*, Mac Millan Company, London, 118pp.
4. Jay, C. Dunlap, Jennifer, J. Loros, Patricia J. De Coursey (ed). 2004. *Chronobiology Biological time Keeping*, Sinauer Associates Inc, Publishers, Sunderland, MA.

Web Resources

1. <https://www.ncbs.res.in/content/animal-behaviour>
2. <https://bit.ly/3i6wUxR>
3. <https://www.behaviour.univie.ac.at/>
4. <https://www.ru.nl/bsi/>

Course Outcomes (COs)

1. Recall and record genetic basis and evolutionary history of behaviour.
2. Classify movement and migration behaviors and explain environmental influence upon behaviour.
3. Analyze and identify innate, learned and cognitive behavior and differentiate between various mating systems.
4. Assess complexity involved in behavioural traits and evaluate hormones and their role in aggression and reproduction.
5. Discuss the rhythmicity of behavioural expressions and the scientific concepts in behavior and behavioral ecology.